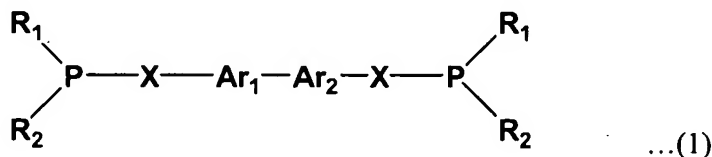


AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

List of the Claims

1. (Currently Amended) A catalyst composition for hydroformulating an alpha-olefin compound comprising a bidentate ligand represented by formula 1, a monodentate ligand represented by formula 2, and a transition metal catalyst represented by formula 3:



wherein

each of R_1 and R_2 is a substituted or unsubstituted C1-20 alkyl group; a substituted or unsubstituted C1-20 alkoxy group; a substituted or unsubstituted C5-20 cycloalkane or cycloalkene; a substituted or unsubstituted C6-36 aryl group; a substituted or unsubstituted C1-20 heteroalkyl group; a substituted or unsubstituted C4-36 heteroaryl group; or a substituted or unsubstituted C4-36 heterocyclic group,

Ar_1-Ar_2 is a bisaryl compound, and

X is oxygen (O) or sulfur (S),



wherein

each of R_3 , R_4 and R_5 is a substituted or unsubstituted C1-20 alkyl group; a substituted or

unsubstituted C1-20 alkoxy group; a substituted or unsubstituted C5-20 cycloalkane or cycloalkene; a substituted or unsubstituted C6-36 aryl group; a substituted or unsubstituted C1-20 heteroalkyl group; a substituted or unsubstituted C4-36 heteroaryl group; or a substituted or unsubstituted C4-36 heterocyclic group, each of R₃, R₄ and R₅ being optionally substituted with nitro (-NO₂), fluorine (F), chlorine (Cl), bromine (Br), or a C1-4 alkyl group,



wherein

M is a ~~transition metal~~rhodium,

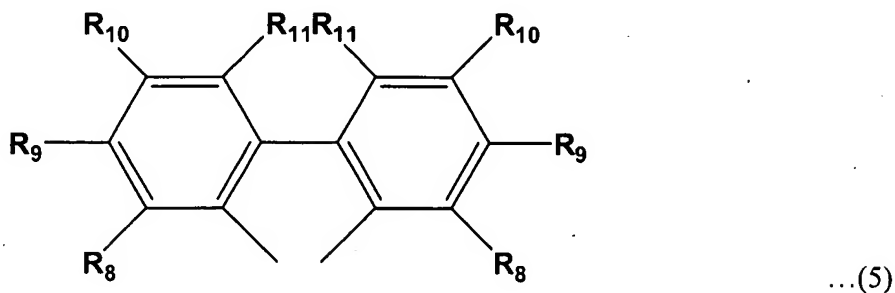
each of L₁, L₂ and L₃ is hydrogen, CO, acetylacetonato, cyclooctadiene, norbornene, chlorine, or triphenylphosphine, and

each of l, m and n is a number of 0 to 5, provided that all l, m and n are not zero simultaneously; and

wherein the concentration of the ~~transition metal~~rhodium is 50 to 500 ppm based on the amount of the catalyst composition, and per mole of the rhodium, the concentration of the bidentate-monodentate ligand is 0.5 to 200.1 to 10 mol and the concentration of the monodentate bidentate ligand is 0.1 to 500.5 to 2 moles, respectively per mol of the transition metal to give a N/I selectivity of 2 to 3, or 3 to 10 moles to give a N/I selectivity of 15 to 18.

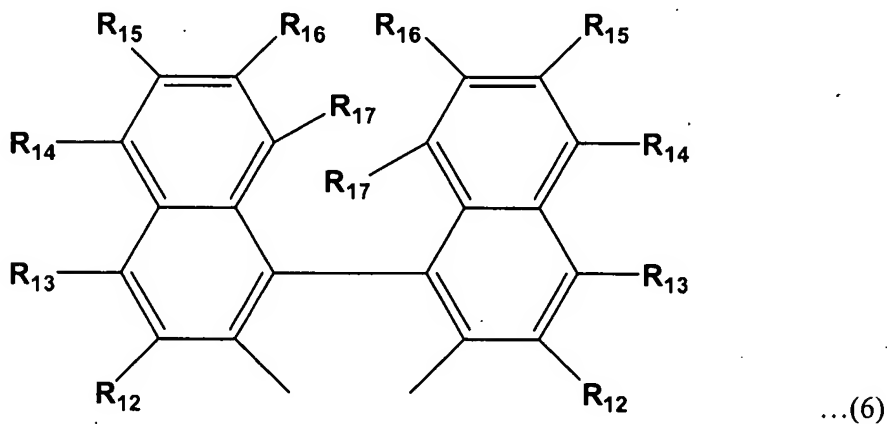
2. (Original) The catalyst composition of claim 1, wherein in formula 1, each of R₁ and R₂ is pyrrole, phenyl, or indole, and the phosphorous is directly linked to a nitrogen atom.

3. (Original) The catalyst composition of claim 1, wherein in formula 1, the bisaryl compound $\text{Ar}_1\text{-Ar}_2$ is represented by either formula 5 or formula 6:



wherein

each of R_8 , R_9 , R_{10} , and R_{11} is hydrogen, a C1-20 alkyl group, a C6-20 aryl group, a triarylsilyl group, a trialkylsilyl group, a carboalkoxy group, a carboaryloxy group, an aryloxy group, an alkoxy group, an alkylcarbonyl group, an arylcarbonyl group, an amide group, a halogen atom, or a nitrile group, the carboalkoxy group being represented by $-\text{CO}_2\text{R}$ (wherein R is a C1-20 alkyl group or a C6-20 aryl group),



wherein

each of R_{12} , R_{13} , R_{14} , R_{15} , R_{16} , and R_{17} is hydrogen, a C1-20 alkyl group, a C6-20 aryl group, a triarylsilyl group, a trialkylsilyl group, a carboalkoxy group, a carboaryloxy group, an

aryloxy group, an alkoxy group, an alkylcarbonyl group, an arylcarbonyl group, an amide group, a halogen atom, or a nitrile group, the carboalkoxy group being represented by $-\text{CO}_2\text{R}$ (wherein R is a C1-20 alkyl group or a C6-20 aryl group).

4. (Withdrawn) The catalyst composition of claim 3, wherein in formula 5, R_8 is methyl, methoxy, or t-butyl group, R_9 is hydrogen, R_{10} is methyl, methoxy, or t-butyl, and R_{11} is methyl or hydrogen.

5. (Original) The catalyst composition of claim 1, wherein in formula 2, each of R_3 , R_4 , and R_5 is phenyl, phenyloxy, cyclohexyl, or t-butyl.

6. (Canceled)

7. (Currently Amended) The catalyst composition of claim 1, wherein the transition metal catalyst is acetylacetonatodicarbonylrhodium $(\text{Rh}(\text{AcAcac})(\text{CO})_2)$, acetylacetonatocarbonyltriphenylphosphinerhodium $(\text{Rh}(\text{AcAcac})(\text{CO})(\text{TPP}))$, or hydridocarbonyltri(triphenylphosphine)rhodium $(\text{HRh}(\text{CO})(\text{TPP})_3)$; acetylacetonatodicarbonyliridium $(\text{Ir}(\text{AcAc})(\text{CO})_2)$, or hydridocarbonyltri(triphenylphosphine)iridium $(\text{HIR}(\text{CO})(\text{TPP})_3)$.

8. (Cancelled)

9. (Canceled)

10. (Currently Amended) The catalyst composition of claim [[9]]1, wherein the transition metal catalyst is acetylacetonatodicarbonylrhodium $(\text{Rh}(\text{AcAc})(\text{CO})_2)$, the bidentate ligand is 1,1'-biphenyl-2,2'-diyl-bis(dipyrrlylphosphoramidite) $(\text{BPO-P}(\text{Pyl})_2)$, and the monodentate ligand is triphenylphosphine (TPP) or triphenylphosphite (TPPI).

11. (Withdrawn) A process of hydroformylating an olefin compound, comprising reacting the olefin compound with a gas mixture of hydrogen and carbon monoxide while being stirred at elevated pressures and temperatures in the presence of the catalyst composition of claim 1 to produce an aldehyde:

12. (Withdrawn) The process of claim 11, wherein the olefin compound is represented by formula 4:



wherein

each of R_6 and R_7 is hydrogen, a C1-20 alkyl group, fluorine (-F), chlorine (-Cl), bromine (-Br), trifluoromethyl (-CF₃), or a C6-20 phenyl group substituted with 0 to 5 substituents selected from the group consisting of nitro (-NO₂), fluorine (-F), chlorine (-Cl), bromine (-Br), methyl, ethyl, propyl and butyl.

13. (Withdrawn) The process of claim 11, wherein the olefin compound is a compound selected from the group consisting of ethene, propene, 1-butene, 1-pentene, 1-hexene, 1-octene, and styrene.